American Druggist

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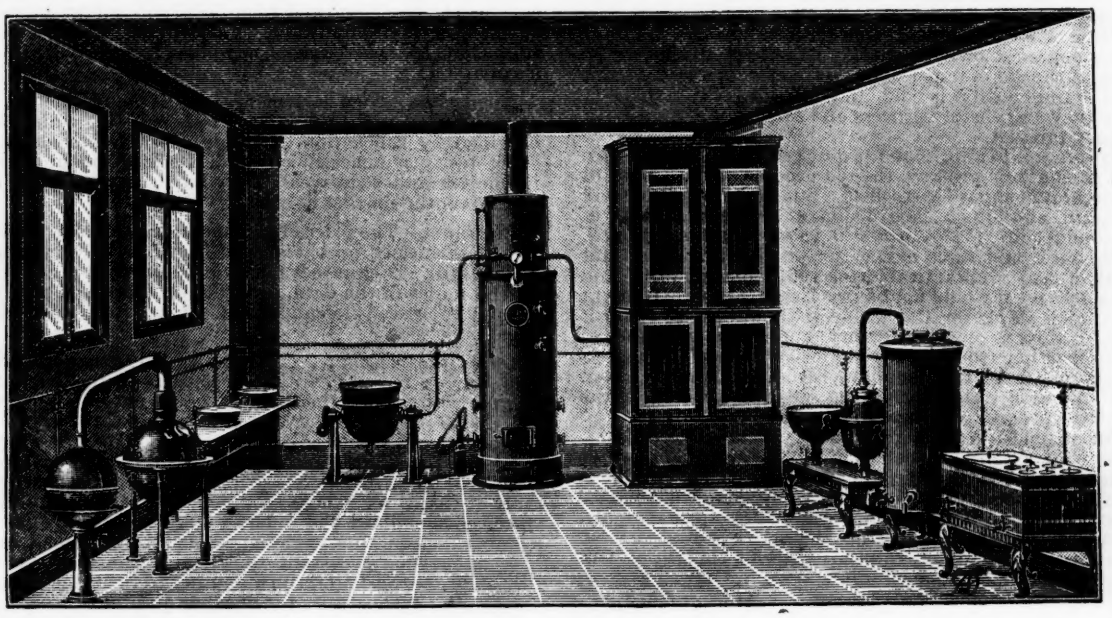
LABORATORY APPARATUS.

THE accompanying cut illustrates the interior of a laboratory such as is recommended by certain leading firms in Europe.

The source of heat and power is derived from an upright tubular boiler, fed with water through a pump. Steam passes from it to the steam drying closet in the corner, to a steam evaporating kettle with movable evaporating pans; next to a distilling apparatus, and to a steam table for the preparation of infusions, decoctions, etc. On the other side is a steam kettle which can be tilted over when it is to be emptied. Next are placed several steam baths and a vacuum apparatus. Of course, the arrangement may be altered to suit circumstances. But the illustration will be of use to those who contemplate the fitting-up of a laboratory, by suggesting not only an economical utilization of space, but also an elegant and pleasing style of apparatus.

The steam kettle with mechanical contrivance for tilting is shown in a separate cut.

Both illustrations represent work executed by F. H. Meyer, of Hannover.

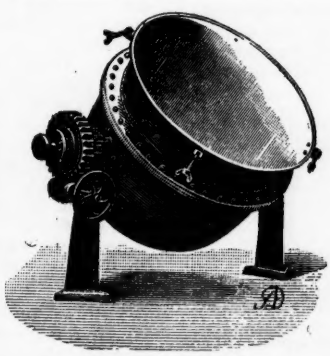


Meyer's Apparatus for Pharmaceutical Laboratory.

Test Paper for Acids.

BY S. J. HINSDALE, FAYETTEVILLE, N. C.

CUT white filtering paper of neutral reaction in pieces of about 6 inches square, and impregnate them with tincture of curcuma (1 part curcuma, 7 parts alcohol, and 1 part water). Place the paper on threads to dry. When dry pass a sheet of it through a bath composed of 40 drops of Liquor potassæ and 100 C.c. water. Then immediately pass it through a bath of water (flat earthen dishes are convenient for the baths), and at once place it on a thread to dry. As soon as it is dry cut it in pieces and enclose them in tinfoil. The paper will not bear long exposure to light and air, but will keep well if enclosed in tinfoil.



Meyer's Steam Kettle.

It is much more sensitive than litmus paper, and will detect acid in a mixture of 1 part of hydrochloric acid in 150,000 parts of distilled water, and will detect carbonic acid in spring water. If the water be boiled to expel carbonic acid, and a yellow color is produced, some free acid (besides CO_2) is shown to be present.

The best way to use the paper is to touch it with a glass rod which has been wetted with the liquid to be tested.

The paper can be freshly prepared in fifteen or twenty minutes.

[*Note by Ed. Am. Drugg.*—The author has sent us a specimen of the paper. We have tried it, and find it to be all that is claimed for it.]

Medicated Waters.*

BY W. P. DE FOREST, OF BROOKLYN, N. Y.

IN accordance with the request of this society, I to-day present a report of a series of experiments on medicated waters, and also show samples of the same. Pressure of business prevented me from extending my investigations to the full line of waters used in dispensing or ordered by the Pharmacopœia, but enough has been done to show what the result would be with the ones omitted.

The subject of medicated waters has received considerable attention from pharmaceutical workers for many years past, and their criticisms induced the revisers of the Pharmacopœia, in 1880, to change the practice of more than half a century in the manufacture of these preparations. The new process has not met with the favor expected of it, for, as far as I can learn, but very few druggists prepare their waters according to the 1880 pharmacopœial method, while with some it has led to open opposition, being designated by them as the "cotton picking business."

As the time is at hand for another revision, it is well for us to examine the different processes, to see if a formula cannot be selected that will give, with but little trouble to the busy druggist, a strongly impregnated water suitable for medical purposes.

The process of distilling the drug with water is conceded by all to furnish the best product for flavor and fragrance, yet it will not be, as it never has been, accepted by the druggists of this country. The majority do not have the appliances for distillation, and they believe the gain is too small, for the importance of these waters is not great enough to compensate for the time required to prepare them in this manner. The compilers of the Pharmacopœia recognized this, and ever since 1830 have discarded that process, and in its place, until 1880, authorized the rubbing of the volatile oil of the drug with carbonate of magnesium, so that it would be brought to a fine state of subdivision and thereby a larger portion taken up by the water. That this gave pretty general satisfaction is evidenced by the length of time it remained official; but the fact that a portion of the magnesia is dissolved by the water, and is liable to decompose the salts of any alkaloids that should happen to be prescribed with the water, made the Pharmacopœia committee ten years ago decide to change to cotton.

* Paper read before the Kings County Pharm. Society.

It is doubtful if the danger was great enough to warrant this, for certainly we have heard of no serious results in the many years that carbonate of magnesium was authorized. The change in the Pharmacopœia of 1880 was so radical, and the new process so unclean, that it is not wonderful the majority of druggists will not accept it. It is one among other things that have led some druggists to speak lightly of the 1880 Pharmacopœia and to avoid it. The old formula was easily and quickly executed; sometimes it could be done while the customer was waiting for the prescription. With the cotton process that would not be practicable.

Various substances have been proposed to take the place of carbonate of magnesium—viz., powdered glass, pumice, phosphate of calcium, talcum, etc.—but none have given as much satisfaction as carbonate of magnesium, except possibly talcum. Dr. Charles O. Curtman, of St. Louis, made a number of experiments, which he published in a paper read before the American Pharmaceutical Association in 1887. He found that talcum was unobjectionable and made a very strong water. It is questionable whether this substance is not as liable to the same objections as the carbonate of magnesium, for it is also slightly soluble in the water. Glycerin has been proposed, to be rubbed with the oil and the water added. This, as will be seen by referring to the samples, gives a fairly good result. As it possesses but little solvent power over the oil, its virtue consists simply in keeping the oil divided by its viscosity until after the water is added, for after that most of the oil can be seen floating on the top or lying at the bottom of the mixture.

Probably the best method, and the one that approaches the nearest to distillation without its trouble, is the use of boiling water to dissolve the oil; the latter is dropped on blotting or filter paper or paper pulp in a bottle, and hot water poured upon it—or it may be put into the hot water without the aid of paper—the mixture well agitated from time to time until it is cold, and then filtered. This is a very easy and cleanly process and furnishes a very satisfactory product.

To sum up, I think that for quickness of manufacture and strength of product the old process of carbonate of magnesium cannot be excelled. But for convenience and strength, and for absence of danger of decomposition of alkaloidal salts, *the hot-water process should be adopted.* Glycerin would rank next. As for distilling, I do not think it is at all practicable for retail pharmacists, and I am positive it would not be practised by them. It might be a good thing for the wholesale manufacturer; for if that process is made obligatory, and a penalty attached for departing from it, the majority of retail druggists would purchase their supplies rather than make them. For camphor water, either the old 1870 process or the new 1880 process will have to be chosen.

The samples I have here to show you are five of camphor water; camphor rubbed with glycerin, and water added; camphor dissolved in alcohol, and water added; camphor rubbed with water alone, one sample of the 1870 process and one of the 1880 process; five samples of cinnamon water in which glycerin, talcum, carbonate of magnesium, and hot water are used; three of spearmint, two of peppermint, and one of anise.

Notes on Some Commercial Drugs and Chemicals.*

Atropine Sulphate.—The new German Pharmacopœia now excludes the former commercial article, which used to be a mixture of hyoscyamine and atropine sulphate. Pure atropine sulphate is now demanded. The melting point of this is 115° C.

Carbolic Acid.—The new German Pharmacopœia permits to use, besides absolute phenol, also the crystallized acid melting at 40° C. The former Pharmacopœia allowed a faint reddish tint, but this is no longer permitted. The new requirement is that the acid should permanently remain colorless.

Cresalol (*para*)—that is, salicylate of para-cresol (para-cresol salicylic ether)—has been only occasionally demanded. It was recommended by Bouchardat as a remedy in summer diarrhœa and cholera morbus.

Ethyl Bromide.—The new German Pharmacopœia gives a method for preparing this substance. It is required to have the spec. grav. 1.445 to 1.450, that is, it is allowed to contain a small percentage of alcohol. The consumption of ethyl bromide has, however, considerably diminished. Moreover, several authorities advise against its use when prolonged narcosis is indicated. Some of the disagreeable after-results reported are "katzenjammer," fetid breath with a taint of garlic or phosphorus. Possibly these are due to contaminations.

A patent has been granted for the process of depriving ethyl bromide of alcohol by means of sulphuric acid, although protest has been raised against the award of this patent.

Glycerin.—Gehe & Co. report that the new test for the purity of glycerin required by the new Germ. Pharm.—addition of ammoniacal solution of silver nitrate, which should not produce a yellow color within five minutes—is too rigorous, they having met only a single specimen which would stand this test.

Guajacol is not used in the same increased proportion as creasote.

Hypnal—produced by combining chloral with antipyrin, and recommended as a safe and efficient hypnotic—has been only in sporadic demand.

Lanolin.—The use of this ointment base is constantly extending. It is, so to say, indispensable when ointments containing substances like hydrogen peroxide, calcium bisulphite, and calcium chloride are to be prepared. Unna, for instance, uses the following combinations:

I.	Solution of Peroxide of Hydrogen	20 to 40 parts.
	Vaseline	20 "
	Lanolin	10 "
II.	Solution of Calcium Chloride (33⅓%)	40 "
	Simple Ointment	20 "
	Lanolin	10 "

The latter forms the basis of all chloride of calcium ointments, and may be modified at will by the addition of resorcin, oxide of zinc, sulphur, etc.

Lysol.—This new antiseptic, regarding the nature and preparation of which no definite information is available, appears to consist of saponified tarry oils. It is, therefore, similar to creolin and other similar compounds. It is said to be very effective, and to have an advantage over creolin in this, that it forms a clear solution in water.

Methylacetanilide.—Under this name the substance bearing the trade-marked name *exalgine* might be used and sold without hindrance everywhere. This we infer from Gehe & Co.'s remarks, as well as from private information.

Phenacetin.—New derivatives of this compound are reported to be methyl- and ethyl-phenacetin, which are obtained by the action of iodide of methyl or iodide of ethyl upon phenacetin-sodium. Both compounds are hypnotics and sedatives. They have, however, not appeared on the market as yet.

Platinum.—The price of this metal has rapidly tripled, and it is highly probable that it will rise very much higher still. The cause is partly a diminished production of the mines in the Ural, owing to drought, and partly a greatly increased demand of the metal for electro-technical purposes.

Quinidine Sulphate.—The use of this cinchona alkaloid, during recent years, has become so extensive in the United States that the demand could not be completely filled, and the price advanced to about three times its former figure. According to Gehe & Co., it is chiefly used (in the United States) as an ingredient of a proprietary medicine for malaria. Originally it was probably so used, as it was so much cheaper than quinine. Besides, it enabled the sellers to puff the remedy as containing "no quinine," against which there is considerable prejudice among certain uneducated classes. At the present time, no doubt, the manufacturers of this remedy would like to substitute the cheaper quinine.

Quinine Sulphate.—The new German Pharmacopœia has adopted the modified Kerner's test for determining the purity of this salt. The amount of water of ammonia allowed to be added so as to produce a clear solution is 4 C.c. This is equivalent to demanding an almost chemically *pure* salt, an absolutely pure one requiring 3.4 or 3.5 C.c. of ammonia. The new Germ. Pharm., therefore, at present requires a higher degree of purity than any other, which, of course, enhances the price considerably, but the required purity may be attained without great difficulty by the manufacturer. This pure form of sulphate of quinine, however, appears in form of heavier and denser crystals, which is a disadvantage to the quinine trade with countries where people are accustomed to buy the salt in the voluminous, light form at present in vogue.

Tannic Acid.—The official tests of the purity of this substance may be advantageously supplemented by observing the color of its 20-per-cent alcoholic solution. The color of this solution often reveals a dark color of the dry acid more readily than an inspection of the acid itself.

* From the September Report of Gehe & Co., of Dresden.

Capsules for Treatment of Gonorrhœa.—Dr. J. W. White, of the University of Pennsylvania, recommends the following mixture, in capsules, for the treatment of acute urethritis. In about two-thirds of his cases the discharge ceased within a week. In the majority it was necessary also to use an injection, and for this he recommends 2 to 10 grains of sulpho-carbolate of zinc in 1 ounce of a 10-volume peroxide of hydrogen solution:

Salol	3½ grains.
Oleoresin of Cubebs	5 "
Copaiba Balsam	10 "
Pepsin	1 "

—*Therap. Gaz.*

A HOLDER FOR EVAPORATING DISHES.

P. BOESSNECK has devised a holder for evaporating dishes. Its shape imitates that of an arm and hand, and may be made of some kind of hard wood [ash, for instance].—*Chem. Zeit.*, 14, 870.

FILTER FOR FRUIT JUICES AND SIMILAR LIQUIDS.

J. ROLFFS recommends, for filtering fruit juices or other liquids which require rapid filtration to prevent their spoiling, to employ a rather thick layer of filter-paper pulp between two pads of gauze. The accompanying cut illustrates the arrangement. A large funnel is filled about half-full with broken glass. Upon this is placed a layer of absorbent gauze, the edge of which extends some distance up along the walls of the funnel. Upon the gauze is then placed a rather thick layer of moist filter-paper pulp, on top of this another layer of gauze, and, to keep it in place, a lot of broken glass is put on top. Water is then passed through until the filtrate is perfectly clear. The filter is now ready, and will be found to work a long time without becoming clogged.—*Pharm. Zeit.*, No. 61.

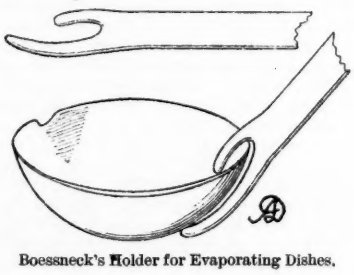
Anemone Pulsatilla

GROWS abundantly almost everywhere on the Continent, including those areas where the *Adonis vernalis* (see page 226) is found. Nature, in fact, has arranged the association and succession of the two plants very conveniently for the collector, since just as the time for taking Adonis is over, the best period for the collection of Pulsatilla begins. Perhaps few plants exhibit such marked variations in different districts as Pulsatilla, and if the systematic botanist ever makes a hobby of this species he might be able to establish to his own satisfaction at least a dozen distinct variations—if, indeed, he did not class them as distinct species.

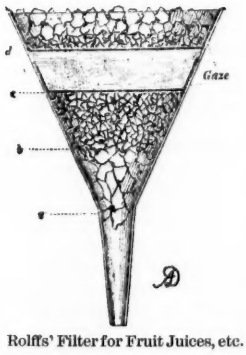
The whole plant is cut down and used fresh as it is for making the homœopathic tincture.

The fresh juice is also expressed and used in the same department of medicine. Pulsatilla is sometimes in great demand, and in connection with this, as producing an effect upon the propagation of the whole species, we have to bear in mind that its use is of comparatively recent date, so that the methods of collection are not matters of transmission from generation to generation.

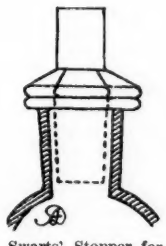
Collection is, as a rule, only undertaken by express order, and the crop is almost exclusively taken up by homœopaths and proprietors of patent medicines.—*Chem. and Drugg.*



Boessneck's Holder for Evaporating Dishes.



Rolffs' Filter for Fruit Juices, etc.



Swarts' Stopper for Reagent Bottles.

IMPROVED REAGENT BOTTLE STOPPERS.

IN order to prevent the annoying immobility of glass stoppers in reagent bottles containing caustic alkalies and certain other liquids apt to cement the stopper so that it cannot be removed, Th. Swarts recommends that the stoppers of reagent bottles be ground so that the conical part fitting into the neck does not fit tight, but that the shoulder of the stopper should be ground together with the neck of the bottle, so as to make a tight joint. Kaehler & Martini, of Berlin, have these bottles in stock.—*Chem. Zeit.*, 14, 836.

The Chemistry of Artificial Musk.

A PRODUCT obtained by the oxidation of oil of amber with nitric acid was at one time known by the name of artificial musk, since it possessed an odor somewhat resembling the latter. But it never had any commercial value. For a year or so past, however, another chemical substance, possessing a powerful musk-like odor, yet having a distinctive difference, has been produced under patents in two French factories. Albert Baur, who discovered it, recently gave some information regarding its constitution.

The starting point is isobutyl-toluol $(CH_3)_2.CH.CH.C_6H_4.CH_3$. [This is obtained from rosin oil (the distillate obtained from rosin) by heating it with oil of vitriol to 100° C., which results in the production of several isomeric sulphonic acids. These are converted into lead salts, and the latter decomposed, in hot solution, by hydrochloric acid. The resulting product contains both the meta- and the para-compound. The former is in large excess and is the substance required. It is separated by fractional distillation.] The pure isobutyl-toluol, as used in this process, boils at 185°–187° C. (uncorrected). This is heated during twenty-four hours on a water bath with five times its weight of a mixture of fuming nitric and sulphuric acid. The result is a mixture of nitro-products, chiefly consisting of trinitro-isobutyl-toluol. By repeating the process the latter is obtained pure. It forms white needles, melting at 96°–97° C., insoluble in water, soluble in alcohol and ether. Even very dilute solutions of it have a very strong musk-like odor, though this is somewhat different from that of natural musk.

The new artificial musk is not poisonous. The homologues of isobutyl-toluol form similar derivatives likewise possessing a strong musk-like odor.—After *Compt. Rend.*, 111, 238.

Composition of Digitonin.

ACCORDING to Schmiedeberg, commercial *digitalin* contains in addition to digitoxin, its most important pharmacological constituent, three glucosides, namely, digitonin, digitalin, and digitaleïn, the first in greater amount, and when heated with dilute acid it yields a substance which reduces Fehling's solution, and also a crystalline compound insoluble in water, which he named digitogenin.

H. Kiliani has recently investigated this subject (*Berichte*, 23, 1555). He dissolved 1 part of commercial digitalin in 10 parts of water, added 1 part of concentrated hydrochloric acid (spec. grav. 1.19), and heated the mixture for six hours on the water bath. By this means a solution and a light-gray precipitate were obtained. The solution contained about equal quantities of two glucoses, which were identified, by means of the melting points of their ozazones and their behavior when oxidized, as galactose and dextrose respectively. The precipitate of digitogenin was crystallized from alcohol, and found to be rather more than equal in amount to either of the two glucoses. It has the constitution $(O_5H_8C)_x$, probably $C_{15}H_{24}O_9$. Digitonin has, therefore, very probably the composition $C_{27}H_{44}O_{13}$, and its hydrolysis is expressed by the equation:

$$\underset{\text{digitonin}}{C_{27}H_{44}O_{13}} + 2H_2O = \underset{\text{digitogenin}}{C_{15}H_{24}O_9} + \underset{\text{galactose}}{C_6H_{12}O_6} + \underset{\text{dextrose}}{C_6H_{12}O_6}$$

This would require a ratio of 1.4 : 1 : 1 between the weights of digitogenin, galactose, and dextrose formed; that actually found is more nearly 1 : 1 : 1, but it must be remembered that at the moment of hydrolysis digitogenin is much more easily attacked than galactose and dextrose, and very readily yields resinous products. An analysis of the raw material agreed well with the formula $C_{27}H_{44}O_{13}$; not so, however, did Schmiedeberg's analysis.

Digitogenin.—The following details may be added to Schmiedeberg's data regarding this substance:

One part requires for solution 35 parts of boiling or 100 parts of cold 93-per-cent alcohol, and 20 parts of boiling or 30 parts of cold chloroform, and 30 parts of cold glacial acetic acid; it is insoluble in water and aqueous alkalies. It seems to form a compound containing chloroform of crystallization, which loses its chloroform only very slowly at 110°. With alcoholic potash it forms a crystalline potassium compound, strongly alkaline, and little soluble in alcohol.

It forms no stable compounds with barium hydroxide or phenylhydrazin, but is attacked by mineral acids and oxidizing agents.—After *J. Chem. Soc.*

Cements of Rubber and Gutta-Percha.

In making a cement, one should know pretty thoroughly, says the *Rubber World*, what is to be expected of it before they could advise upon it.

For instance, an ordinary rubber cement will hold on a host of different surfaces and with the best of success, except where there is continued dampness. For holding to damp walls, or surfaces where there is a constant presence of moisture, there is nothing equal to Jeffry's Marine Glue, the formula for which has been published and republished all over the world.

It consists of:

India Rubber	1 part.
Coal Tar	12 parts.
Asphaltum	2 "

The rubber, after having been massed, is dissolved in the coal tar, and the asphaltum is then added. This glue, as its name indicates, is oftentimes used for mending articles at sea, or patches, for instance, that are to be laid on surfaces that are to be under water, and it has been found to be a most excellent thing.

Of glass cements there are a great many, rubber, as a rule, being dissolved in some very volatile solvent, and some hard-drying gum is added. A gutta-percha cement for leather is obtained by mixing the following; it is used hot: Gutta-percha, 100 parts; black pitch or asphaltum, 100 parts; oil of turpentine, 15 parts. An elastic gutta-percha cement—especially useful for attaching the soles of boots and shoes, and which, on account of its great elasticity, it is not liable to break or crack when bent—is prepared as follows: By dissolving 10 parts of gutta-percha in 100 parts of benzin. The clear solution from this is then poured into another bottle containing 100 parts of linseed oil varnish, and well shaken together. To make it adhere tightly, the surface of the leather is slightly roughened.

Good rubber cement for sheet rubber, or for attaching rubber material of any description or shape to metal, may be made by softening and dissolving shellac in ten times its weight of water of ammonia. A transparent mass is thus obtained, which after keeping three or four weeks becomes liquid, and may be used without requiring heat. When applied, it will be found to soften the rubber, but when the ammonia is evaporated it forms a kind of hard coat, and causes it to become impervious to gases as well as liquids. Davy's universal cement is made by melting 4 parts of common pitch with 4 parts of gutta-percha in an iron vessel and mixing well. It must be kept fluid under water or in a dry hard state. A very adhesive cement, especially adapted for leather driving belts, is made by taking bisulphide of carbon 10 parts, oil of turpentine 1 part, and dissolving in this sufficient gutta-percha to form a paste.

The manner of using this cement is to remove any grease that may be present in the leather by placing on the leather a piece of rag and then rubbing it over with a hot iron. The rag thus absorbs the grease, and the two pieces are then roughened and the cement lightly spread on. The two pieces are then joined and subjected till dry to a slight pressure.

A solution of gutta-percha for shoemakers is made by taking pieces of waste gutta-percha, first prepared by soaking in boiling water till soft. It is then cut into small pieces and placed in a vessel and covered with coal-tar oil. It is then tightly corked to prevent evaporation and allowed to stand for twenty-four hours. It is then melted by standing in hot water till perfectly fluid, and well stirred. Before using it must be warmed, as before, by standing in hot water.

A cement for uniting india rubber is composed as follows: 100 parts of finely chopped rubber, 15 parts of resin, 10 parts of shellac; these are dissolved in bisulphide of carbon.

Another india-rubber cement is made of 15 grains of india rubber, 2 ounces of chloroform, 4 drachms of mastic; first mix the india rubber and chloroform together, and when dissolved the mastic is added in powder. It is then allowed to stand by for a week or two before using.

Cement for sticking on leather patches and for attaching rubber soles to boots and shoes is prepared from virgin or native india rubber by cutting it into small pieces or else shredding it up; a bottle is filled with this to about one-tenth of its capacity; benzin is then poured on till about three parts full, but be certain that the benzin is free from oil. It is then kept till thoroughly dissolved and of a thick consistence. If it turns out too thick or thin, suitable quantities must be added of either material to make as required. An elastic cement is made by mixing together and allowing to dissolve the following: Four ounces of bisulphide of carbon, 1 ounce of fine india rubber, 2 drachms of isinglass, ½ ounce of gutta-percha. This cement is used for cementing leather and rubber, and when to be used the leather is roughened and a thin coat of the cement is applied. It is allowed to completely dry, then the two surfaces to be joined are warmed and then placed together and allowed to dry.

Cement used for repairing holes in rubber boots and shoes is made of the following solution: 1. Caoutchouc, 10 parts; chloroform, 280 parts. This is simply prepared by allowing the caoutchouc to dissolve in the chloroform. 2. Caoutchouc, 10 parts; resin, 4 parts; gum turpentine, 40 parts. For this solution the caoutchouc is shaved into small pieces and melted up with the resin, the turpentine is then added, and all is then dissolved in the oil of turpentine.

The two solutions are then mixed together. To repair the shoe with this cement, first wash the hole over with it, then a piece of linen dipped in it is placed over it; as soon as the linen adheres to the sole the cement is then applied as thickly as required.

A New Monobromocamphor.

The action of bromine on camphor may be said to be a commercial process for the production, for pharmaceutical purposes, of the ordinary monobromocamphor, or monobromated camphor. The yield of the latter is, in the first operation, a comparatively small one. There accompanies the crystalline bromocamphor a considerable quantity of an oil which, according to Swarts, is the hydrobromide of bromocamphor, $6C_{10}H_{15}BrO+HBr$. By distilling this oil the yield of bromocamphor is, as is known, materially increased. The existence of such a compound as that assumed by Swarts is, however, open to serious doubt. J. E. Marsh has recently investigated the action of bromine upon camphor (*Journ. Chem. Soc.*, 1890, 828), and has found that it results in the production of *two* isomeric monobromocamphors.

The ordinary monobromocamphor of the Pharmacopœia may be designated as the alpha variety. Its properties are sufficiently well known.

The new isomer, designated as iso- or beta-monobromocamphor, is best prepared by the action of bromine on camphor in presence of alcohol, the diluent alcohol which was also employed by Swarts appearing to facilitate the subsequent separation of the two isomers. This separation is in any case a difficult one, and Mr. Marsh is unable to say that he separated the bodies absolutely. Still there can be no doubt about the general results.

The beta-isomer is extremely soluble in alcohol, and is separated from the ordinary variety by fractional crystallization from alcohol. It is further separated from unaltered camphor by distillation *in vacuo*. On solidifying, after being thus distilled, it forms an almost transparent mass, easily breaking up into a soft, granular powder, very different in appearance from the hard crystals of the ordinary modification. It melts at about 61° C. It is very soluble in alcohol, chloroform, carbon bisulphide, petroleum ether, and glacial acetic acid. It rotates the plane of polarized light to the right, but less so than the ordinary variety.

Detection of Biliary Matter in Urine.

According to Dr. Adolf Jolles, of Vienna, who has made a comparative study of the various bile reactions so far proposed, the most reliable tests are those proposed by Rosenbach and by Huppert.

Rosenbach's test is as follows: A piece of filtering paper is wetted with the filtered urine, and a drop of nitric acid then applied to it. Colored rings will form about the drop of acid (*Centralbl. f. med. Wissensch.* [1876], 14, 5).

Huppert's test: Precipitate the urine with milk of lime. Exhaust the precipitate with alcohol containing sulphuric acid, and apply heat. A green color is developed (*Archiv f. Heilkunde* [1867], 8, 351, 476).

Dr. Jolles has found that both tests are capable of improvement. In the case of Rosenbach's he recommends the following modification: Filter a large quantity of the urine to be tested through pure, white filtering paper, then apply to the inside of the filter a drop of concentrated nitric acid containing some nitrous acid, and pass the funnel containing the filter three or four times, and slowly, over a Bunsen burner. After a few minutes observe the rings which will have formed around the drop. If they are colored green, bile pigments are present. The application of a gentle heat reveals even traces of these pigments. The bright-green ring shows the presence of biliverdin.

The reliability of Huppert's test depends mainly upon the strength of the milk of lime. As the author of the test failed to specify it, Dr. Jolles made experiments, and found that the most suitable strength was about 1 per cent—that is, a milk of lime containing about 10 Gm. of lime in the liter. The test is best executed as follows:

About 8 to 10 C.c. of the urine are mixed with an equal volume of the milk of lime, the mixture is shaken, and the precipitate separated by filtration. The precipitate is then transferred, by means of alcohol and diluted hydrochloric acid, into a beaker, the whole filtered again, and the filtrate raised to boiling. If biliary pigments are present, the liquid assumes a color varying between green and blue; if none are present, it remains colorless. —After *Zeitsch. f. anal. Chem.*, 1890, 402.

Borate of Zinc.—Borate of zinc, $Zn(BO_2)_2$, has recently been introduced as an efficient remedy in certain skin diseases, such as eczema. It is reported to act much better than the oxide, or even the benzoate or carbolate of zinc.

APPARATUS FOR THE AUTOMATIC FILLING OF FILTERS.

THE accompanying cut (Fig. 1) illustrates the metbod recommended by T. Guenther for keeping filters or funnels automatically filled, either in simple filtration or in washing precipitates.

When filtration is to be started, the rubber tube *d* is compressed with one hand and the rubber bulb B pressed with the other until the liquid rises through the tube *a* and flows into the filter. Tne tube *d* is now released and pressure on B removed. The apparatus then continues to work automatically until all the liquid in the flask A, down to the end of the tube *a*, has passed over. It will be noticed that the wide glass tube dipping into the filter serves as the air valve. When the liquid in the filter has sunk below the orifice of the tube a new supply of liquid passes over.—*Chem. Zeit.*, 14, 666.

A SIMILAR construction is employed in the apparatus devised by O. Kleinstueck (Figs. 2 and 3). In this a rather wide glass tube is introduced into the reservoir containing the liquid to be filtered. The glass tube may rest on the bottom or may be held by the stopper, but it must, at its upper part, be in communication with the air enclosed in the reservoir. Through the stopper and wide tube passes another, narrow glass tube, the end of which is cut off obliquely. The tube delivering the liquid into the funnel is bent at a right angle, and the vertical portion is of such a length that its orifice is about half an inch below the level of the outlet of the inner tube in the reservoir. Whenever the level of liquid in the funnel sinks to a level corresponding to the outlet of the inner tube (see the dotted line), air will pass into the reservoir through the inner tube, but it will be compelled to pass upward inside of the larger tube, whereby all disturbance or agitation of the main bulk of the liquid is avoided, which is sometimes of importance, particularly when it is not desired to disturb a precipitate. The flow of liquid stops as soon as the level of liquid in the funnel has risen again above the dotted line.

FIG. 1.

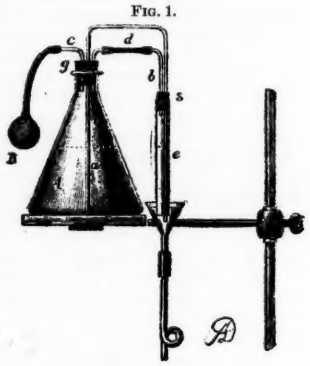


FIG. 2.

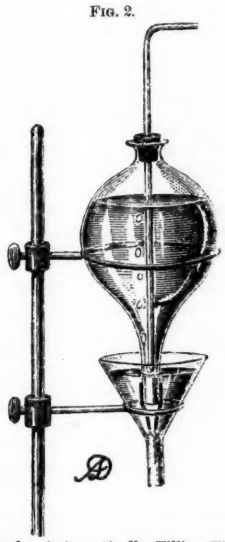
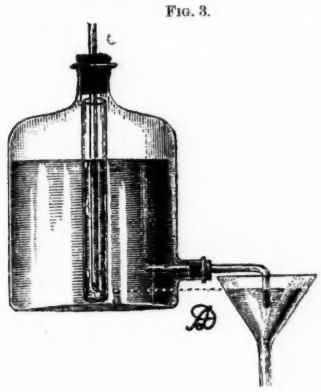


FIG. 3.



Apparatus for Automatically Filling Filters.

When it is desired to filter the liquid down to the last drop, it is best to use a large globe funnel as reservoir and to adjust this directly over the funnel.—*Chem. Zeit.*, 14, 666.

Assay of Belladonna and Belladonna Plasters.

AT the recent meeting of the Amer. Pharm. Association held at Old Point Comfort, Va., Mr. Seward W. Williams read a paper on "Belladonna Plasters," in the course of which he gives an account of the generally accepted methods of assay of belladonna plasters, and submits a modified process devised by himself. It should be stated here that belladonna is no longer the only source of hyoscyamine or atropine, but that the root of *Scopolia Carniolica*, which is abundantly accessible in the market, affords the same alkaloids, hyoscyamine being held to be the alkaloid originally present in the root, which is, however, liable to be changed to atropine in the course of extraction. Regarding the assay of belladonna plasters the author says:

Methods for the valuation of belladonna plasters may be based upon the following facts:

The mass generally consists of extract, rubber, resins, etc. The active principle is alkaloid, which, when free, is soluble in chloroform, alcohol, ether, and benzol, and insoluble in water; when combined with an acid as a salt, it is soluble in water and alcohol, but insoluble in chloroform. Mayer's reagent—a solution of potassium mercuric iodide—combines in practically definite proportion with the alkaloid of belladonna. It is prepared by dissolving 13.546 Gm. of mercuric chloride in a solution of 49.8 Gm. of potassium iodide in about 800 C.c. of distilled water, and diluting to exactly 1,000 C.c. Repeated titrations of solutions of Merck's pure atropine, from 1 to 300 to 1 to 400 dilution, showed that 1 C.c. will precipitate 0.012 Gm. and nearly the same quantity of hyoscyamine (0.0117). Dr. E. R. Squibb places the limit of the mydriatic power of belladonna alkaloid at 1 drop of a dilution of 1 to about 91,000 for sulphate, equivalent to about 1 to 106,000 for free alkaloid. Vitali's qualitative reaction is obtained by adding to alkaloidal residue upon evaporation a few drops of fuming nitric acid, heating on steam bath to dryness, and adding, when cool, a drop or two of an alcoholic solution of potassium hydrate—violet coloration.

Process 1.—Accurately weigh one or two plasters, cut in strips, remove mass from cloth with as little warm chloroform as will answer, transfer chloroform mixture to a globe separatory funnel, turn upon the cloth an equal volume of 2½-per-cent sulphuric acid, transfer to separator, shake carefully with chloroform mixture, and allow liquids to separate several times. The chloroform mechanically carries the alkaloid, presumably as a salt, from the cloth to the separator, where the acid water on agitation takes it into solution. The chloroform mixture is run off and the water filtered into another separator. The chloroform is returned to separator and extracted with small portions of acid water until a little gives no reaction for alkaloid. The cloth is dried and weighed. The filtered acid water solution is washed with chloroform. It is then made alkaline with ammonia, and extracted with chloroform by careful agitation until a portion fails to give reaction for alkaloid when evaporated, dissolved in acid water, and tested with Mayer's reagent.

The chloroform extract, washed by agitation with distilled water, is drawn off and distilled or evaporated. The alkaloidal residue may be dissolved in about 350 times its weight of acidulated water and titrated direct with Mayer's solution; or it may be purified by softening with a drop or two of chloroform, taking up with warm, stronger ether and filtering into tared beaker, when it may be evaporated and dried to constant weight.

This residue may be dissolved in just 300 times its weight of 2½-per-cent sulphuric acid, one-half titrated with Mayer's reagent, a little of the remainder best made alkaline with ammonia and extracted with chloroform, evaporated for Vitali's test, and 1 C.c. diluted to 350 C.c. for physiological test. By this method, a plaster standardized to one-half per cent alkaloid, assayed 0.495 per cent by direct titration; another plaster, 0.52 per cent by weight of impure alkaloid, which in dilution of 1 to 109,500 (1 C.c. 1 to 300 solution to 365 C.c.) caused dilatation of the pupil within 45 minutes in three persons, a drop having been introduced into the eye of each.

The process would be theoretically more perfect if, in the first step, after removing the mass with chloroform, the mixture were introduced into the separator after the cloth had been washed with chloroform alkaline with ammonia, and the washing liquid shaken with the acid water, the cloth not being treated with water.

The one difficulty with this process is the formation of emulsions by shaking, which seriously embarrass the operation. These emulsions may be evaporated and residue taken up with alkaline chloroform.

The process in its essential features accords with directions given by Dr. A. B Prescott in his work on "Organic Analysis." There the first chloroform is made alkaline with ammonia, and absolute alcohol used to purify the final residue.

Process 2.—The writer has found it possible to avoid trouble with emulsions by the following method: Remove mass from cloth with chloroform alkaline with ammonia, and precipitate rubber with alcohol (94 per cent); drain off the liquid, soften the mass with a little chloroform and again precipitate with alcohol, and repeat operation if necessary to prevent occlusion of alkaloid by the rubber in precipitation. Unite the liquid extracts and evaporate on a little acid-washed sand not quite to dryness. Extract sand by rubbing up with 2½-per-cent sulphuric acid until a check test shows the sand to retain no alkaloid. Sand is used to prevent occlusion by resinous matter. The acid-water extract is filtered

and washed with chloroform. It is then rendered alkaline with ammonia, extracted with chloroform, and further treated as in first process. In an assay by this process the alkaloidal residue purified with ether was, by calculation, 0.53 per cent. The alkaloid, though failing to fully titrate up to this weight with Mayer's reagent, showed a marked mydriatic effect in dilution of 1 to 108,000, one drop dilating the pupil in 40 minutes in one case and one hour in another. In experiments made with a view to abbreviating the process in point of time, Mr. C. E. Parker found that after precipitating the rubber with alcohol from the alkaline chloroform extract, the chloroform largely thrown out by direct addition of distilled water retained most of the alkaloid, and that by shaking the mixture with alkaline chloroform the alkaloid could be completely extracted, despite the carrying of some chloroform into the water by the alcohol.

The writer finds this abbreviation of the process a very practical improvement.

Process 3.—Take two plasters, accurately weigh and digest in 100 C.c. warm chloroform alkaline with ammonia. Drain the mixture from cloth, precipitate rubber with 50 C.c. of alcohol (94 per cent), and drain off liquid into a separatory funnel, shake with 150 C.c. of distilled water, and draw off chloroform into another separator. Treat the cloth with 50 C.c. alkaline chloroform, washing off the remaining mass, and with this mixture soften residual mass of rubber and gummy matter. Precipitate rubber again with 25 C.c. of alcohol. Shake liquid with the water mixture in first separator and draw off chloroform into the second. Repeat softening and precipitation of mass, if necessary, with 25 C.c. chloroform and 12 C.c. alcohol, and pass liquid through first separator as before; further extract liquid in first separator with alkaline chloroform, if necessary, and draw off into second. The chloroform in second separator is then extracted with acid water, and that, washed with chloroform and afterward made alkaline, is extracted with chloroform and proceeded with as in other processes. In an assay by this process an attempt was made to purify the residue by softening with chloroform, taking up with warm benzol, extracting with acid water, making alkaline, extracting with chloroform, and evaporating the chloroform, after washing with distilled water, in a tared beaker. Dried to constant weight the alkaloid weighed 0.1105 Gm. and calculated 0.478 per cent, showing a loss by purification. This residue was dissolved in 33.15 C.c. of 2½-per-cent sulphuric acid. An exact cubic centimeter of this 1 to 300 solution was diluted to 435 C.c. with distilled water and well shaken. This dilution of 1 to 130,500 was tried upon the eyes of eight persons, one drop being used in each case. A dilatation was noted in each individual within 50 minutes. Scrupulous care was taken to avoid any contact with apparatus not perfectly clean. The remarkable activity in some cases indicated that the limit of dilution had not been reached. Dragendorff's limit, it may be noted, is 1 to 130,000 for atropine. This alkaloid was from *Belladonna Scopolia*, and would appear physiologically rather more active than that from *Atropa Belladonna*, if there be any difference. This process by direct titration with Mayer's solution gave practically 0.50 per cent alkaloid with plasters of same strength.

In the writer's experience volumetric work with Mayer's solution, when conducted under the same conditions used in establishing the factor from pure alkaloid, gives results which compare most favorably with gravimetric work in point of accuracy, and much more than favorably in the matter of time.

In working with Mayer's reagent shake the solution violently, after each addition of solution, in flask provided with tight rubber stopper. Toward the end of the process the solution will generally clear, so filtration is unnecessary.

In gravimetric work the perfect purification of the alkaloid without loss is a difficult matter.

In calculating results of volumetric work the number of cubic centimeters of Mayer's reagent × 0.012 × 100 ÷ (weight of plaster — weight of cloth) gives percentage of alkaloid in mass. In gravimetric work the weight of alkaloid × 100 ÷ net weight of mass gives percentage.

Absolute accuracy is not claimed for these processes, but they are capable of showing the strength within about one-fiftieth per cent alkaloid. Standardization within this narrow limit surely merits the name, in view of no pharmacopœial standard other than that of a widely varying root.

The writer is indebted to Charles E. Parker, Ph.C., for valuable assistance in the work involved by this paper.

Koch is now a "bigger" man than old Bismarck.

Poisoning by Bromethyl.—Three cases of poisoning by bromethyl have lately taken place in Berlin, and Dr. Mittenzweigs, in the *Journal for Medical Officers*, warns people against the employment of this narcotic in dentistry, where it has been much used, as well as in small surgical operations, until proper experiments have been made. In the cases of poisoning above alluded to, the doses had not been more than about 20 Gm.

Adonis Vernalis.

THIS plant grows in some parts of Europe only in a limited number of places, and may be regarded as somewhat rare; its shining golden flowers, half hidden in the finely divided pinnate leaves, resembling a little bouquet artistically surrounded by delicate ferns. The *Adonis vernalis* is one of the prettiest of flowers. It blossoms in the earliest spring, when only the *Anemone sylvestris* throws up here and there its delicate white corolla, vying in grace and beauty with its more resplendent golden-hued relative.

Where the *Adonis vernalis* is found it will generally be met with in quantity, though not distributed over a very wide area. At one time such spots were the haunt of the botanist only, being remote from the public roadways, in quiet nooks unknown to the ordinary forest wanderer.

This all changed, however, when it was announced that the little ranunculaceous plant, connected by legend with a heart affection of another and less dangerous kind, possessed virtues that would render it valuable in the treatment of cardiac diseases.

The collection of the plant is simple enough. It takes place just when the flowering is over and the fruit is partially developed. It is then about one foot high, and is cut off close to the ground or uprooted. The drug is thus obtained at the period of highest physiological activity.—*Chem. and Drugg.*

Ether-Drinking in Ireland.

RECENT inquiries, says the *Telegraph*, show that in certain parts of Ulster methylated ether is still largely used in substitution for whiskey. The practice is believed to have originated during the phenomenally successful teetotal movement inaugurated in the first quarter of the present century by Father Mathew. Persons who had taken the pledge of total abstinence from whiskey discovered that without violating their consciences they could, by the use of ether, still indulge in the habit of intoxication. The secret gradually leaked out, the mischievous custom rapidly spread, and it has now, in particular districts, become confirmed. A medical correspondent affirms that the spirit referred to is very largely used in South Derry, particularly in the localities of Draperstown, Tobermore, and Maghera. "It is brought hither," he writes, "in large Winchester quarts, and is sold by grocers, etc., principally to women, who retail it through the country. It is called into requisition frequently at balls, lodge meetings, etc., when the public houses are closed or the drink runs short. The intoxicating effects come on speedily, and pass away with equal rapidity, so that one can get drunk and sober several times in the course of an afternoon and evening. This is one of its charms, another being its cheapness. I have heard of cases of over-doses of it, and I find that when taken along with, or shortly after, whiskey, the consumer becomes very outrageous—far worse than when whiskey alone is used. It is very hard to get any definite information as to the quantity brought to the locality, but it is very considerable. The atmosphere of Maghera, Draperstown, etc., on a fair day is polluted with the smell of it, so that you can scarcely escape it anywhere. About 2 drachms is the usual draught, but those who are accustomed to it can readily swallow an ounce at a time. It is the methylated ether that is invariably used."

These statements are fully borne out by inquiries in the Draperstown and Bellaghy districts. Another correspondent observes that "the ether is still largely used. I saw 100 gallons at one time in the stores of one dealer some twelve months before he died. I have seen gastritis of a subacute kind produced by its use. Last January a man on his way home died from the effects of it, and some time since several deaths from the direct effects of ether-drinking were recorded—some of them from spasm of the glottis."

In a further communication it is stated:

"In a district of South Derry included by a line drawn from Ballyronan through the villages of Castledawson, Knockloughrin, Gulladarff, and Claudy to Portglenone, and bounded on the other side by Lough Neagh, Lough Beg, and the Bann, ether-drinking is prevalent to some extent. It is not used, however, at all so extensively as in the districts having as their centre Maghera and Draperstown. It is sold in the village of Bellaghy by grocers. The draught—viz., the amount taken at one time—is 2 drachms usually, but much more can be taken as a draught by an experienced hand. I am informed that the singular thing about the ether intoxication is the rapidity with which it comes and passes off. A man may, in fact, be drunk all night, and yet have lucid intervals. A young boy of 14 once assured me that he could easily take a noggin, viz., 5 ounces, during a night; but then he belonged to a family all celebrated for their convivial powers. I have often noticed on Cookstown market days the odor of ether, and I have no doubt it is largely sold in that part of County Tyrone. Methylated ether is only 1*s.* 2*d.* per pound, while pure ether is 5*s.* 4*d.* per pound, wholesale price. It is the former, I believe, which is consumed."—*Br. and Col. Drugg.*

Toxic Effects of Exalgine.

MR. EDMUND E. DYER reports in the *British Medical Journal* (August 30th, page 506) a case in which the administration of exalgine for the relief of muscular rheumatism was followed by symptoms resembling those due to carbolic acid poisoning. The exalgine was ordered in a mixture with tincture of orange and water, in 2½-grain doses three times a day, the quantity being therefore somewhat larger than that given by Prof. Fraser, of Edinburgh, but less than that given by Drs. Bardet and Dujardin-Beaumetz.

Six doses in all were taken. The symptoms were: Sleep broken by starts and waking at short intervals; pain in the small of the back; urine olive-green, scanty, of high specific gravity, with large deposits of urates, but free from phosphates, albumin, or blood; temperature, 98°; pulse, 102, full and strong; thirst and hot and dry skin. The renal trouble disappeared upon stopping the exalgine and giving a diuretic and diaphoretic, and the cerebral symptoms passed off.—*Chem. and Drugg.*

The Toxic Principle of Insect Powder.

THE active principle of Pyrethrum flowers is, according to Schlagdenhauffen and Reeb, an acid (pyrethrotoxic acid) soluble in alcohol, amylic alcohol, ether, and chloroform, which may be isolated by means of ether, after having been converted into an alkaline salt and decomposed by tartaric acid in aqueous solution.

When pyrethrotoxic acid was hypodermically injected into animals, it was observed that the poison produced its effects in two distinct stages. In the first there was an excitement more or less pronounced, proportional to the quantity administered; in the second there was a complete prostration, accompanied always by paralysis of the lower extremities, which might disappear after a time, or be the precursor of a fatal issue, the respiration and circulation being affected only in the latter case.

Saponated Glycerin as an Ointment Base.

SOME time ago Dr. Von Hebra introduced a new basis for skin ointments under the name of "Glycerinum Saponatum," about which he spoke very highly. Recently he has given full particulars regarding the glycerin in the *Zeitsch. f. Therapie.* It is made from cocoanut oil or tallow soap which has been dried at from 80° to 100° C.; this is then powdered and dissolved in glycerin by the heat of a water bath, and filtered while hot.

The product on cooling is a yellowish, more or less elastic mass, which softens at the heat of the body. Obviously, it dissolves in water, and that is one property which makes it especially useful in the preparation of ointments.

Two strengths of the glycerin are used, one containing 8 per cent and the other 20 per cent of soap. The former is used for insoluble substances, such as oxide of zinc.

An ointment containing 5 per cent of the substance is very good for tender skin, and is simply rubbed on. It is specially serviceable as an application for chapped hands. For eczema an ointment composed of glycerin 78 parts, zinc oxide 20 parts, and starch 2 parts, is employed. Other preparations made with the softer glycerin are: (*a*) Sulphur, 10 per cent; (*b*) sulphur 20 per cent, and zinc oxide 10 per cent; (*c*) iodoform, 5 per cent; (*d*) chrysarobin, 10 per cent; (*e*) hydroxylamine hydrochloride, 1 per cent; (*f*) ichthyol, 5 per cent. With the harder Glycerinum saponatum the following preparations are made, viz.: (*g*) salicylic acid, 5 per cent; (*h*) salicylic acid and resorcin, 5 per cent each; (*i*) salicylic acid and creosote, 5 per cent each; and (*j*) salicylic acid 3 per cent, Pix liquida 10 per cent. It will be observed that for insoluble bodies the glycerin containing 8 per cent of soap is used —After *Chem. and Drugg.*

The Cultivation of Castor Oil in Senegal.

THE *Moniteur Officiel du Commerce* publishes a report which the French Colonial Office has received from M. Carstaing on the subject of the cultivation of the castor-oil plant in Senegal.

In June, 1888, M. Carstaing drew the attention of the governor of the French colony of Senegal to the advantages which would accrue from the cultivation of the indigenous castor-oil plant, particularly the species which spontaneously decorticates itself in the sun, and which M. Carstaing had discovered. The government agreed to undertake experiments in this direction, and at the end of June, 1888, 10,000 seeds were sown in a plantation at Sor, near Saint-Louis, and 6,500 were distributed to private persons to experiment upon at the public cost.

The extreme dryness of the climate had prevented the success of several other attempts of a like kind, such as those with earth nuts, millet, and beans. It was, fortunately, found that the castor-oil plant was able to resist this obstacle, and in its first season the plantation at Sor produced 300 kilos of good seeds. In May, 1889, other plantations of castor oil were founded at Dakar-Bango, Louga, Kelle, and Thiès. By the close of December, 1889, the government was able to announce that these new areas of cultivation had proved twice as successful as any one had dared to hope. The plants had in six months grown, at Thiès and elsewhere, to a height of from 3 to 4 meters, with a rich crop.

During the rainy season of the present year a great number of applications have been made by planters in various parts of Senegal for seed of the best quality, and fresh plantations have been opened, with 1889 seed, in Rufisque, Gorée, and other places. It has been so clearly shown that the soil and climate of Senegal are favorable to the growth of the castor-oil plant that preparations are being now made for a very wide cultivation of it throughout the colony in February, March, and April of next year. The principal difficulty in the way of this new industrial enterprise is the resistance of the natives, who cannot be persuaded that earth nuts and castor oil can be simultaneously grown in the same piece of ground. This is quite a mistake, however; by planting the castor-oil plants of the first year sufficiently sparsely, success is certain.

The principal trading houses of Bordeaux and Marseilles have promised to support the colony of Senegal in the cultivation of castor oil by offering a market for the product. They consider that the new industry will prove a source of immense wealth to the colony, the present prices being highly remunerative. The accident that the crops of earth nuts have lately been a failure makes the administration of Senegal only the more anxious to secure this new and valuable product. Offers have already reached Saint-Louis from two American houses, and it is believed that the colony will have no difficulty in selling all that it produces.

The numerous uses to which castor oil is now put are very encouraging to the cultivation of the plant. It can be utilized, besides in its medicinal capacity, in dyeing, soap making, greasing machinery, lighting, printing, the manufacture of Dutch cheese, exported butter, for cement in Java, and for food in China; the Chinese boil castor oil with alum and sugar to remove the bitter taste.—*Br. and Col. Drugg.*

An Organic Volatile Nickel Compound.

L. MOND and C. LANGER have found (*Chem. Trade Journ.*, 1890, 412) that nickel enters into a compound with carbon monoxide, having the composition $Ni(CO)_4$. It was obtained by passing a mixture of gases (generator gases) containing CO over metallic nickel and cobalt, the authors intending to have the CO arrested by the metals and decomposed. Instead of this, a volatile compound containing nickel passed over, while the cobalt was found not to enter into combination with CO.

The new compound, $Ni(CO)_4$, is a colorless liquid, volatile at the ordinary temperature, boiling at 43° C. (109.4° F.), and having the specific gravity 1.3185 at 15° C. It is soluble in alcohol, benzol, and chloroform. If the vapor is heated to 60° C. (140° F.), it explodes.

No practical use has as yet been made of this compound. But it is to be expected that it can be utilized, chiefly for technical purposes.

Oils of Mint and Origanum in Turkey.

IN a recent number of the *Revue Medico-Pharmaceutique,* Mr. O. Boulonthian gives some interesting particulars of the essential oils of mint and origanum in Anatolia, in Asia Minor. Every one who has lived in Constantinople knows the yaghdjis, itinerant street venders of small bottles of essential oils of origanum, anise, mint, cassia, cloves, sandal-wood, and of a number of quack remedies for rheumatism, hæmorrhoid balsam, and so forth, which they carry on a tin tray. These yaghdjis all hail from the vilayet of Koniah, where the distillation of mint and origanum has been carried on for ages in the same old-fashioned way. The oils are distilled over an open fire, and the still used is exactly the same model as that employed in remote Turkish villages for the preparation of brandy. The villagers cut the plants and put them up in faggots or bundles, which they throw into the container and boil with water. The essential oil carried away by the vapor is collected by means of a feather.

The plant from which the mint oil is distilled in this district is the *Mentha rotundifolia.* It is exceedingly aromatic and rich in essential oil. The latter, when pure, is of a greenish color and has a slight odor of camphor.

It is always slightly cloudy, and possesses a faint by-flavor, owing to the rough manner in which the distillation is carried out. Of the two oils about 600 or 700 okes (an oke equals about 2¾ pounds) are distilled every year—so the yaghdjis aver. The oils are very rarely had in a pure state, but it is thought that if the cultivation were carried on with modern stills and in a more business-like way, the oil of mint might have a good commercial future. At present a large quantity is exported from Constantinople to Egypt, but the bulk of it is retailed in the manner described, by the yaghdjis, who carry it all through European Turkey and Asia Minor.—*Chem. and Drugg.*

A Source of Error in Sulphuric Acid Estimation.

PROF. E. VON MEYER points out that sulphur is liable to be introduced even into plain water which is being evaporated over a gas flame in a porcelain capsule, the sulphur being recognized by a distinct reaction of sulphuric acid. The accession of sulphur from a gas flame to the contents of crucibles in which fusions are conducted has long been known, and is guarded against by every skilled analyst; but that sulphuric acid can be produced in a simple liquid like water during the process of evaporation is new. One of Prof. Meyer's assistants evaporated 2 liters of pure water, in a porcelain capsule standing upon a *high* water bath over a gas flame, to 60 C.c., which required six hours. The water was then found to yield 0.0426 Gm. of barium sulphate, corresponding to 0.00731 Gm. of SO_3 per liter.

Another assistant evaporated 1 liter of water in a platinum capsule over a small Bunsen flame, the quantity of water in the capsule being maintained at between 40 and 50 C.c. During twelve hours there were produced 0.0106 Gm. of SO_3.—*Journ. prakt. Chem.*, 1890, 270.

Chloroform Water as a Preservative.

JOS. F. BURNETT says:

For the keeping of various chemicals in solution, so as to be convenient in rapid dispensing, nothing that I have tried is so effective and at the same time so free from objection. It is, of course, not needed for the solutions of inorganic substances, such as potassium bicarbonate, magnesium sulphate, potassium bromide, etc., which are kept in most dispensing establishments. The advantage is evident in the case of solutions of organic chemicals, which are prone to decompose, ferment, etc., through the presence of fungoid organisms. The following is a list of these, which I keep regularly made, in each instance solution being effected by dissolving the substances in B. P. chloroform water, and adjusting to strength by a final addition of more chloroform water:

Citric Acid	1 in 2
Potassium Acetate	1 in 2
Potassium Citrate	1 in 2
Ferri et Am. Cit	1 in 2
Sod. Salicylat	1 in 2
Am. Chloridi	1 in 4
Am. Bromid	1 in 4
Quinine Sulphate*	1 in 10

Never in any of the above do I find any trace of fungoid growth, even though occasionally I have had a solution by me, in the varying temperature of summer and winter, for months. In speaking of solutions I will refer to two mixtures which are of equal convenience, viz., powdered rhubard and aromatic powder of chalk, both of which I keep ready rubbed down with chloroform water (1 in 8), so that the time and trouble required in dispensing these in mixtures may not have to be expended a dozen times an hour. Mucilage of acacia made with aq. chlor. keeps indefinitely. Hitherto there can be no drawback to the use of chloroform water as a preservative, for the addition of 1 or 2 drachms, or even an ounce or two, to a mixture, cannot have any injurious effect on the patient. All the medical men for whom I dispense are aware of my practice, and none of them have any objection whatever.

The second class of substances I preserve with chloroform is infusions, either B. P. strength or concentrated 1 to 3. Those with which I have experience are quassia, both single and concentrated; gentian (strength as B. P., but without orange and lemon), single and concentrated; senega, single and concentrated; cascarilla, single and concentrated; and calumba, buchu, and orange in the concentrated strength only. I find the preservative action of chloroform is perfect in all these when concentrated, the chloroform being added to the strained infusion in the proportion of 1 drachm (fluid) to each 40 fluidounces, and dissolved by agitation. The aroma of these preparations when diluted is much more like the fresh infusion than any concentrated 1 to 7 preparations of wholesale house manufacture I have used, and in no case does the chloroform cause any deposit—an advantage over alcohol when the infusion contains mucilaginous matter. Some practitioners object to the use of concentrated infusions preserved with alcohol on this very account. With the infusions made single strength (*i.e.*, B. P.), chloroform in a less proportion than a half drachm to 40 ounces will not keep them at all, except in the case, perhaps, of cascarilla, and if they are required to be kept more than a week they require rather more than that, unless alcohol be added as well. For instance, half an ounce of chloroform (dissolved by agitation) will not keep 2 gallons inf. seneg. good for seven days, but the same quantity with 2 ounces tr. seneg. will keep the same infusion a fortnight at least. From these experiences I infer that when chloroform is employed as a preservative the liquid must be nearly saturated with it, otherwise it will not preserve it for any great length of time. In the case of single strength infusions this is a disadvantage, as it will be seen at once that a dose of 1 or 2 ounces (if saturated with $CHCl_3$) contains from 2 to 5 minims of chloroform, which, of course, is inadmissible, as it becomes a medicinal if not an injurious dose.

In some instances (I have not tried it in all) the chloroform may remain undissolved at the bottom of the bottle, when it exerts its preservative influence (as, *e.g.*, in the case of solutions of pot. cit. and pot. acet.), but care must be taken not to pour it out when the bottom of the bottle is reached or neared.

* By aid of q. s. H_2SO_4 dil.

MR. HAROLD WYATT, JR., a hospital dispenser, says:

Among the solutions in which chloroform water was used were those of quinine and of morphine; they remained quite clear and free from fungoid growth for a length of time equal to that during which 25 per cent of proof spirit would have kept them good. A mixture of ergot and strychnine used in the hospital kept very badly in the concentrated form, becoming fetid and covered with mould in four days; when made with chloroform water no change whatever occurred. Alkaloidal salts had also been very well kept in chloroform water, such as strychnine, morphine, cocaine, with no single failure. When 1 part of chloroform water was added to 6 of fruit juices the aroma was rather improved. In this way he kept raspberry, lemon, and blackberry. In allusion to the use of glycerin as an alternative to chloroform water, as recommended in the "Year Book" for 1888, the author said he had kept essence of rennet clear and free from the slightest unpleasant odor for a long time. Lastly, chloroform has proved an efficient and unexceptionable preservative in a preparation of opium used as an external application in which spirit was not desired.

A Note on Eucalyptus Oil.

THE following is contributed by Mr. P. W. Squire to the *Chemist and Druggist:*

Having lately had occasion to examine a number of samples of Eucalyptus oil, ordered and invoiced as Amygdalina, and the variations being more marked than in probably any other essential oil used in pharmacy, the results seem to be of sufficient interest to be placed on record.

The tests applied were: (1) specific gravity; (2) rotation as shown by a Zeiss polarimeter; (3) "phellandren" test, the presence of which is understood to distinguish the *Amygdalina* oil from that obtained from *E. globulus.*

[*Phellandren Test:* Dissolve a few cubic centimeters of the oil in twice its volume of glacial acetic acid, and add a saturated solution of sodium nitrite. The oil separates, generally assuming a green color, and in the case of an Amygdalina oil quickly sets to a semi-solid mass of phellandren nitrite, which afterwards becomes brown. The Globulus oil shows no solidification, and the green color is more permanent.]

	Sp. Gr.	Rotation.	"Phellandren."
A	0.912	+ 12°	None.
B	0.909	+ 12°	"
C	0.874	− 38°	Strong reaction.
D	0.889	− 24°	" "
E	0.897	− 30°	" "
F	0.893	− 3°	" "
G	0.817	− 120°	Very strong reaction.
H	0.874	− 111°	" " "
I	0.909	− 5°	None.

Subjoined are also the figures for some oils invoiced as *Globulus:*

	Sp. Gr.	Rotation.	"Phellandren."
Californian	0.909	+ 17	None.
Schimmel	0.915	+ 7	"
Merck	0.904	+ 11	"
Gehe	0.921	+ 4	"

The following general inferences may be drawn:

A and B are obviously *Globulus* and show that two of the largest London wholesale houses [and this seems to be the case also with some wholesale houses in this country.—ED. AM. DRUGG.], ignorantly or intentionally, are supplying this for *Amygdalina.*

C, D, E, and F are normal *Amygdalina* oils.

G and H are a variety of *Amygdalina* oil of which we have as yet seen no description. It is characterized by an abnormally high rotation, so high that the Zeiss instrument was incapable of measuring the angle till the oil was diluted with absolute alcohol. The phellandren reaction was also very strongly marked. One of the oils (G) was very dark yellow, and the other (H) quite colorless, but their other characters are so much alike that it is probable H is G redistilled.

I is an oil intermediate between the *Amygdalina* and *Globulus*, and is probably distilled from mixed leaves. It was obtained directly from the firm who were the first to point out the radical differences between the two varieties.

Detection of Lead in Water.

HARVEY points out that even slight traces of lead may readily be detected in water by the chromate test.

To about 1½ liters (3 pints) of water about 2 grains of pure, *crystallized* chromate of potassium (*not* bichromate) are added, solution promoted by agitation, and the solution set alongside another glass containing the same water without addition. The water should not be acid, nor should it have been concentrated. The chromate must be added in crystals, not in powder. Water containing as little as $\frac{1}{15}$ grain of lead in the gallon becomes turbid in about fifteen minutes. After twelve hours the precipitate has become completely deposited, so that the liquid may be poured off.

No other metal likely to occur in water yields a similar reaction. For practical purposes the above test is amply sufficient. One-fifteenth of a grain of lead in 1 gallon of water corresponds to 1 part of lead in 3,500,000 parts.—After *The Analyst*, 1890, 68.

The Cultivation of Opium in Mexico.

THE question of the desirability of cultivating the poppy in Mexico is being agitated. It is believed that a quality equal to the best produced in the various sections of Asia, where it is grown with most success, could be obtained. Sinaloa and Sonora are never troubled by the frosts which blight the crops of the plant in Persia and Western Asia. Further, the rich alluvial soils in the valleys of the Sonora, Oposura, Yaqui, Mayo, Rio Fuerte, and Rio de Culiacan will, without any question, result in opium of the finest kind being produced, such as never could be attained in the low damp soils of Bengal and Southern China.

The argument that cultivation ot the poppy will bring along with it the curse of opium smoking has been satisfactorily met by the fact that the vice is almost altogether unknown in Bengal, Asia Minor, and Persia, where opium has been largely produced. Even suppose such were not the case, modern science cannot do without the drugs that come from the poppy. The improper use of a thing cannot, or at least ought not to, be the excuse of an embargo being placed upon its existence, when it can be shown the blessings that arise from it are so potent and numerous that it would be a crime to forbid its proper use. Medical practice shows laudanum and the other forms known to the Pharmacopœia to be imperative necessities. No squeamish arguments ought, therefore, to be allowed to maintain when the absence of opium from the physician's cabinet would be equivalent to the actual murder of a patient under many conditions that arise in the experiences of the disciples of Galen.

Great Britain now has a monopoly of the drug. She would no longer have it if Mexico, by the aid of American capital, were to enter into competition with her. Statistics show that the Indian government made a clear profit on the exportation of opium to the amount of about $46,000,000 in 1872, almost the same sum that it realized in 1885. In order to hold on to this monopoly in India, where the government does not absolutely control, it puts on a duty of $400 to $450 a case, equal to about four Mexican dollars a pound. Mexico could almost at once obtain the entire Chinese trade and drive this British governmental trust out of the market. China alone cannot grow sufficient opium for her own use. Now she has to depend on England, and frequently for an inferior quality of the drug at the high prices charged for the best. As already stated, neither China nor Bengal approaches Mexico in the matter of desirable conditions for the production of opium.

The cultivation of the poppy is one of the simplest imaginable. In Mexico, even the very slight precautions deemed necessary to bring it to a condition suitable for the production of the inferior grades of opium of China and India need not be troubled about. Climate and soil combined would attend to that. The Indians of Mexico, including children, could be very quickly shown the simple methods of opium making. As soon as the poppy is ready, after some four months' growth, all that is wanted is to carefully make an incision with a knife into the fruit transversely from the top down. This is generally done in the afternoon, and the following morning the capsule will be covered with the juice of the plant. This is scraped off with a knife on to a poppy leaf, into which sufficient is gathered to make a small cake or ball. It is then wrapped up in a few leaves and left to dry. The same plant can be visited several times as its head ripens. The opium when dried up, and each pellet usually weighs between 1 and 2 pounds, is ready for sale.

In the matter of quality Mexico can have but one rival, and that is Egypt; but as that country only cultivates 4,500 hectares as against 2,250,000 in the Benares district of India alone, it would be hardly worth considering. If Mexico, as seems highly likely, at once enters into the production of opium, she would wonderfully increase her export trade and force English competition to the wall.

The *Mexican Financial Review*, which is greatly interested in the exploitation of the matter, says: "The Indian government pays the producer $250 per case of opium, which sells for $700 to the Chinese merchants. This sum of $250 suffices to pay the cost of production and the profits of the grower. These figures may fairly be accepted as representing the probable return for a case of opium produced in Mexico; for although labor is a trifle dearer here than in India, the soil would be virgin as far as the poppy is concerned, and would yield a richer harvest. The net profit on such a business to be divided between the Mexican producer and the Mexican government would thus be the difference between $250 and $700 per case, at which last it could be sold in China."—*Export and Finance.*

Note on the Comparative Medicinal Values of the Official Buchus.

MR. C. J. S. THOMPSON had his attention directed by a medical friend to the fact that the infusion of buchu leaves when prepared from the serratifolia variety differed slightly in color and taste from that made with either of the other official species. The medical gentleman also noted that in the case of a patient who had been in the habit of taking an infusion in which the crenulata or betulina varieties had been used, on an infusion prepared from the serratifolia leaves being substituted, the difference in the medicinal action was very marked. The characteristic features of the three official species of buchu leaves are well known. According to several investigations the therapeutic properties of the leaves are due to the presence of a volatile oil, having a peppermint-like odor, and of a bitter resin. The oil, which deviates the ray of polarized light considerably to the left, on exposure to cold furnishes Barosma camphor, forming needle-shaped crystals, having almost the exact odor of peppermint. On submitting the several varieties of buchu leaves to microscopical examination, it was noticed that the circular cells containing the oil on the under part of the leaf were closer together and much larger in the crenulata and betulina than in those of the serratifolia, the oil glands of the latter being both smaller and fewer in number. Assuming the therapeutic activity mainly to depend on the quantity of the volatile oil and resinous matter the leaves contain, a number of samples from each of the official sources were procured, with the object of estimating the average proportion of these principles present in each variety.

Several samples of the leaves of Barosma betulina having been treated with ether were found to yield on an average 4.25 per cent of resinous matter, of a dark, olive-green color, aromatic but bitter to the taste, and having the characteristic odor of buchu. It was found to be but slightly soluble in hot water, more so in alcohol, and easily soluble in chloroform. The same samples on distillation yielded on an average 1.45 per cent of volatile oil, which developed after a time the strong peppermint-like odor. From samples of the Barosma crenulata, submitted to similar treatment, an average of 3.75 per cent of resinous matter of same color and taste was obtained, and 1.6 per cent of the volatile oil. The samples of serratifolia, treated in like manner, gave an average of 3.45 per cent of resin, but of a bluish-green color and slightly different taste to the others. Barely 1 per cent of volatile oil was obtained.

On incineration the leaves of the betulina gave an average of 4.5 per cent of ash, those of the crenulata 4.6 per cent, and the serratifolia yielded 5.3 per cent. It has been suggested that the medicinal action in some instances is greatly assisted by the presence of the mucilage which buchu leaves contain in a considerable quantity, and that probably acts by allaying the irritation of the mucous membrane and assisting the volatile oil in chronic inflammation and other diseases of the genito-urinary organs. This suggestion would seem to be borne out by the fact that the fresh infusion of the leaves is preferred, and regarded as more effective than the tincture in the treatment of such cases. The leaves of the serratifolia species contain less mucilage than either of the other varieties.

The result of this somewhat rough investigation would seem to indicate that the leaves of Barosma serratifolia are probably inferior as regards their medicinal value to those of the Barosma crenulata or the betulina, and pharmacists would do well to employ the latter varieties only in making the official preparations.—*Br. and Col. Drugg.*

Effect of Temperature on Nessler's Test.—A. Hazen and H. W. Clark (*Amer. Chem. Journ.*, 12, 425) find that the low results obtained by them and by Smart were due, not to imperfect condensation of the ammonia, but to the low temperature of the distillates, which had been condensed in a block-tin condenser. It is found that the color produced in the Nessler test varies with the temperature, and is deeper according as the solution is warmer; it is thus necessary to bring the distillate and the standard ammonia solution to the same temperature before comparing the tints which they give with the Nessler solution.

The Quantitative Determination of Arsenic by Marsh's Apparatus.

DR. ED. POLENSKE some time ago showed that it was possible to make a quantitative determination of arsenic by means of Marsh's method; but, according to him, a very large amount of zinc and a very long time are required to complete the reaction. B. Kühn and O. Saeger have taken up the same subject, and have found that, by suitably altering the conditions, a much larger quantity of arsenic may be isolated and determined in a comparatively short time.

It has heretofore been generally held that arseniuretted hydrogen does not react with potassa. The authors, however, found that it does. Hence no wash bottle containing solution of potassa must be interposed in the current of the gas.

In order to obtain exact results, the directions below given must be scrupulously followed.

The apparatus required is an Erlenmeyer flask of the capacity of about 400 C.c., into which 150 Gm. of arsenic-free zinc, in granules, are introduced. The flask is closed with a doubly perforated rubber stopper, carrying a funnel tube, 50 Cm. long, reaching to the bottom of the flask, and also a gas delivery tube connected with a 50-C.c. wash bottle containing solution of acetate of lead, for the purpose of arresting any hydrosulphuric acid which may be generated. The wash bottle is connected with a large and several small drying tubes containing at least 100 Gm. of fused chloride of calcium. The last of these drying tubes is connected with a piece of so-called combustion tubing about 165 Cm. long. This long tube rests in a combustion furnace of 80 Cm. in length and having 24 burners, in such a manner that it projects about 25 Cm. over the furnace on the side of the chloride of calcium tubes, and about 60 Cm. on the other side. Its inner diameter should be 10 to 12 Mm. The portions projecting beyond the furnace are drawn out so as to be only of 5 Mm. calibre. The furthest end of this tube is connected with a flask containing solution of nitrate of silver.

Over the funnel tube passing through the stopper of the Erlenmeyer flask are arranged two burettes, one of which is filled with pure diluted sulphuric acid (1 volume of acid of spec. grav. 1.840, and 3 volumes of water). The other burette contains the arsenical liquid, which should not contain more, or correspond to more, than 0.110 Gm. of arsenious acid in 25 C.c.

After the apparatus has been put together and tested as to tightness, the generation of hydrogen gas is started by allowing about 30 C.c. of the diluted sulphuric acid to flow into the flask. When all air has been expelled, all the burners of the furnace are lit and the combustion tubing heated as far as it lies in the furnace. If after half an hour no sign of an arsenical mirror is visible in the contracted portion of the tube at the further end of the furnace, the materials and apparatus may be regarded as being uncontaminated with arsenic.

Three more separate burners are now placed under the projecting end (60 Cm.) of the combustion tube, at intervals of 15 Cm., so as to render the tubing red hot—care being taken to support it properly—and then the arsenical liquid is allowed to pass into the flask in drops, not more rapidly than 0.5 C.c. per minute, particular care being taken that the current of hydrogen gas remains active and regular. The proper rate is such that the bubbles of gas passing through the lead solution can just be counted. This is best attained by allowing the sulphuric acid to pass into the flask at the rate of about 0.75 C.c. per minute.

After a few minutes, an arsenical mirror will make its appearance in the contracted part of the tube beyond the furnace. Frequently there will also be a mirror formed beyond the first and second separate burners, but none will be formed beyond the third if the process is conducted as above directed. Nor will there be any change produced in the silver solution. Should there be the least sign of a metallic mirror beyond the third burner, the current of gas must be moderated, or the whole experiment repeated.

It should take one hour to pass the 25 C.c. of arsenical liquid into the apparatus. The heat and current of gas, however, are continued for two hours longer, and the passing current of gas is occasionally tested for arsenic by applying a burner to the contracted part of the tube before it enters the furnace. If an arsenical mirror forms here, it is simply driven forward by applying heat. If none forms, the arsenic is all volatilized.

When this is the case the apparatus is allowed to cool, with the current of gas still passing. Next a current of pure hydrogen is passed through the tube in the opposite direction, and all the minor arsenical mirrors driven forward so as to join the main one, which has acquired a black color, of a metallic lustre. The portion of the tube containing the mirror is then cut out, dried, and weighed. After dissolving off the mirror with strong nitric acid, the empty tube is washed, dried, and weighed again. The difference is the quantity of metallic arsenic found.

If it is desired to preserve the mirror, it is best done in the following manner: Introduce the narrow tube containing the mirror into a larger one drawn out to a point. Apply heat gradually near the open end, and the mirror will eventually be driven by the flame into the point of the larger tube. The small tube can then be removed empty and weighed.

The analytical data accompanying the original are very satisfactory.—After *Berichte.*

A New Method of Testing Honey.

DR. OSCAR HAENLE has communicated a new method for ascertaining the purity of honey.

It is only about five years back that every expert would have condemned as adulterated any honey which was found to turn the ray of polarized light to the right instead of to the left.

About that time Dr. Haenle succeeded in finding, while travelling, some natural (wild) honey which polarized to the right. This was subsequently ascertained to be due to the fact that the bees fed upon coniferous products, while those feeding upon flowers produced lævogyre honey. While the polariscope had, before this discovery, been generally used as a certain criterion to distinguish between genuine and adulterated honey, this instrument could no longer be employed for the purpose without some restriction. The author has now ascertained that if the honey be dialyzed before the polarization test is applied, the result is a certain indication of the character of the honey.

Honey consists of grape sugar and fruit sugar. The crystallizable part of honey is the grape sugar, while the other constitutes the uncrystallizable part. [Fruit sugar, or levulose, is also crystallizable, but with some difficulty. —ED. AM. DRUGG.]

From the author's account of experiments we select the following, which show how the method is applied and how the results are interpreted. [It remains to be seen, however, whether the finally remaining feeble polarization to the right is a constant and invariable property of a honey adulterated with glucose, or whether protracted dialyzation could not extract the glucose entirely.—ED. AM. DRUGG.]

I. EXPERIMENTS WITH HONEY COLLECTED FROM FLOWERS.

1. A pure Alsatian honey was dissolved in twice its weight of water. The solution polarized 28° to the left (— 28°). It was then subjected to dialysis during sixteen hours, after which the residue remaining in the dialyzer was optically inactive (0°).

[The author does not describe the form of dialyzer he used. We shall have occasion to try the method, and shall use a dialyzer made of artificial parchment, of considerable width, so that only a shallow column of liquid shall be dialyzed at a time.—ED. AM. DRUGG.]

2. Thirty Gm. of a pure honey were dissolved in 150 Gm. of water, the solution decolorized and then dialyzed. After eighteen hours the residue was inactive.

3. Fifty Gm. of a similar honey were dissolved in 250 Gm. of water. The solution polarized at −11°. After sixteen hours' dialysis the residue was optically inactive. On further evaporating the latter and again dialyzing, its inactivity remained unaltered.

II. EXPERIMENTS WITH GLUCOSE SYRUP.

4. A 10-per-cent solution of glucose syrup which polarized 100° to the right (+ 100°) was decolorized and then dialyzed. After sixteen hours it still polarized + 5°. The residue was then concentrated, and in proportion as this progressed so rose the angle of polarization.

III. EXPERIMENTS WITH HONEY PURPOSELY ADULTERATED.

5. Forty Gm. of a pure honey, polarizing in a 1 in 2 solution at — 35°, were mixed with 10 Gm. of glucose syrup. A 10-per-cent solution of the mixture was subjected to dialysis, and the residue was found to remain dextrogyre at + 4°.

6. Thirty Gm. of a pure honey were mixed with 20 Gm. of glucose syrup, dissolved in 250 parts of water, and the solution decolorized by charcoal. It polarized at 65°. After twenty-four hours' dialysis the residue retained a permanent polarization of + 14°. After concentrating this residue to half its weight its polarizing angle had increased to + 60°.

7. Fifty Gm. of a pure honey were dissolved in 250 Gm. of water. The solution polarized at + 95°. It was then dialyzed, and the liquid on the dialyzer examined in intervals of two hours. The following is the rate at which polarization decreased until it remained constant:

After 2 hours		+ 45°.
" 4	"	+ 33°.
" 6	"	+ 18°.
" 8	"	+ 15°.
" 9	"	+ 12°.
" 10	"	+ 11°.
" 11	"	+ 10°.
" 12	"	+ 10°.

Further dialyzation did not change the angle (+ 10°).

General Conclusions.—Any honey which, after having been dialyzed, does not turn the ray of polarized light to the right, is free from glucose. Any honey which, after dialysis, retains a permanent dextrogyre polarization, contains glucose.—After *Pharm. Zeit.*, 1890, 441.

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EDITORIAL.

NOTHING in the way of medical discovery during this century has equalled in importance the announcement made by Prof. Robert Koch, of Berlin, in the *Deutsche Medicinische Wochenschrift* of November 14th, of a cure for tuberculosis; and were it not that the probity and scientific accuracy of its author are too well established to admit of doubt, much that is claimed for this new remedy would be incredible. Like most discoveries of great importance, the narrative is so simple and direct as to win our unqualified admiration.

A despatch from Berlin of November 20th says:—"The 'Frank Courier' states that the lymph used by Professor Koch for the cure of tuberculosis is prepared in an incubating stove within a space that is hermetically sealed and sterilized, and thereby rendered free from fungus. The interior of the air-tight space is divided by an unglazed porcelain diaphragm into an upper and lower section. In the upper section is placed a salted meat broth in a gelatinous state, containing colonies of the tubercle germ. This mass gradually liquefies, and the gelatin liquid drops slowly through the porcelain plate into the lower section. The liquid then contains all the secretory products, but is free from all living or dead germs or reproductive spores, and is the lymph as used."

In other words, the lymph is an organic fluid containing the ptomaïnes developed by the growth of the tubercle bacillus in the meat broth.

Professor Koch says:—"This remedy is a brownish, transparent liquid, which does not require special care to prevent decomposition. For use this fluid must be more or less diluted, and the dilutions are liable to undergo decomposition if prepared with distilled water. As bacterial growths soon develop in them they become turbid, and are then unfit for use. To prevent this, the diluted liquid must be sterilized by heat and preserved under a cotton-wool stopper, or, more conveniently, prepared with a one-half per cent solution of phenol. It would seem, however, that the effect is weakened both by frequent heating and by mixture with phenol solution, and I have therefore always made use of a freshly prepared solution. Introduced into the stomach the remedy has no effect. In order to obtain a reliable effect it must be injected subcutaneously.

"When injected under the skin of a healthy human being, 0.01 C.c. produces hardly any or no reaction. The same is true with regard to those who suffer from other diseases than tuberculosis. When, however, the subject of the experiment suffers from tuberculosis, the injection of 0.01 C.c. causes severe general and local reaction. The general reaction consists in an attack of fever, which usually begins with rigors and raises the temperature above 39°, often up to 40°, and even 41 C. This is accompanied by pains in the limbs, coughing, great fatigue, and often sickness and vomiting. In several cases a slight icteroid discoloration was observed, and occasionally an eruption like measles on the chest and neck. The attack usually begins four to five hours after the injection, and lasts from twelve to fifteen hours. Occasionally it begins later and then runs its course with less intensity."

Passing over the description of the local effects of the remedy, it is to be remarked that its usefulness in determining the existence of tubercle in suspected cases is perhaps of quite as much importance as its curative properties, since it is curative only during the first stage of the disease and before the tubercular deposits have become dead matter.

Already hundreds of physicians and thousands of invalids have gone to Berlin, and the effect of this sudden influx of infected persons must become a subject which greatly concerns the residents in the hotels and boarding houses of that city, and must lead to some expedition in disseminating, through reliable channels, the knowledge requisite for the production and use of the remedy.

Looking at the question from a purely business point of view, there is little immediate advantage to accrue to pharmacists. The production of the ptomaïne-bearing lymph is likely to remain, for some time at least, in the hands of those who conduct pathological and microscopical laboratories; but the increased attention which will be given by physicians to bacteriological technology may enable pharmacists to increase their sales to physicians of the various substances used.

If Prof. Koch's discovery is to be followed by successful research into the prevention and cure of other diseases by similar methods, it may be that the pharmacology of the future is to bear as little resemblance to that of the present as the latter has to that of antiquity, and that doctors as well as pharmacists will have need for greatly enlarging the area of their usefulness in the community in order to achieve an income. Doubtless, when that time arrives, the employment of remedies directed, as so many now are, to the relief of symptoms, will have greatly diminished, and alkaloidal and other plant derivatives will have given place to polysyllabic substances of purely chemical origin and ptomaïnes of intensely virulent character, the effects of which upon the vital fluids and processes will be estimated with mathematical precision.

The question of the possibility or otherwise of assaying galenical preparations of the active principles of plants will have been settled by their practical abolition, and the literature of the subject be as much a curiosity as that relating to the discovery of the philosopher's stone.

A CURIOUS coincidence is worthy of being mentioned in this connection. The telegram from Berlin of the 20th of November, above quoted, was published in New York daily papers on the 21st. On the same day the *Medical Record* of this city published a paper by Dr. E. L. Trudeau, of Saranac Lake, N. Y., on "An Experimental Study of Preventive Inoculation in Tuberculosis," in the course of which the author narrates a series of experiments with what seems to be precisely the same fluid as that which Koch claims to be curative, and observed in rabbits much the same disturbance of the general system as that described by Koch when comparatively large quantities of the lymph are so used. These rabbits were subsequently tuberculized, and then killed, and Dr. Trudeau says:

"The results are briefly told. All the rabbits are more or less tubercular. The lesions of those in whom this preventive inoculation [referring to inoculation with 'Dead Surface Cultures,' 'Sterilized Liquid Cultures,' and 'Filtered Cultures'] was practised, differs from those observed in the controls but little, except that *in the rabbits previously injected with the filtered cultures . . . the disease is somewhat more advanced.*"

Here we find a most honest, painstaking, and competent observer, working in the depths of the Adirondack wilderness hundreds of miles from any laboratory, just missing the discovery which is making Koch famous.

WITH this issue we bring our nineteenth volume to a close, and with the commencement of the twentieth we shall inaugurate changes in the character of the jour-

nal which we believe will increase its usefulness for the majority of its readers.

We would be pleased if our subscribers would make use of our pages for a freer interchange of views upon topics relating to the business of the pharmacist. It is not always, or indeed frequent, that busy men have time for exhaustive compositions upon any subject, no matter how familiar they may have become with its details; but the things which to them appear somewhat trite or trivial are often of great interest to their less accomplished fellows, and afford subjects for study and experiment which fit them for a higher class of work. Every man likes to attain to a reputation for skill and ability in his vocation, but only exceptionally do we find those who possess the opportunities or genius which enable them to carry out a scheme of original research. There are sufficient opportunities, however, in pharmacy for study of questions of daily practice in the laboratory and at the counter to occupy the attention of men of a lower grade of talent, and a suggestive query or a narrative of some difficulty met with in the course of every-day experience will often prove of more immediate and practical value than the longer dissertation upon a more abstruse subject.

Finally, we wish to urge upon those who are not inclined to writing that they may greatly over-estimate its difficulties, and fail to appreciate its effect in increasing their faculties of observation and their knowledge of pharmacy. Every man has had to make a beginning in literary composition, and he who commences soon and writes most will, other things being equal, get the most good from the practice and do the most good for others.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,491.—**Tablet Machine** (D. P. H., Washington, D. C.).

Richter's tablet machine, mentioned on page 204 of our November number, can probably be obtained through Eimer & Amend, of Third Ave., cor. 18th St., in this city, who will import it if they have not got it already.

No. 2,492.—**Lysol** (J. F.).

This is the name of a preparation furnished by Schnelke & Mayr, of Hamburg, which is reported to be a solution of tar oils in soap. According to M. Schottelius, it is an efficient disinfectant. It appears in form of a brown, syrupy, transparent liquid, which can be diluted with water without becoming turbid. It turns red litmus paper blue, but does not contain any free alkali. The specific gravity is about 1.035 to 1.055. The same firm are also preparing a "Lysolum purum," which has the specific gravity 1.042 at 19° C., has a lighter color, and is transparent in thin layers.

We have not seen either preparation so far, but have taken the above data from several exchanges.

No. 2,493.—**Liquid Glycerin Soap** (O. W. T.).

A new formula for this has recently been given by the *Chemiker Zeitung:*

Mix 500 parts of olein, 100 parts of 91-per-cent alcohol, and 280 parts of solution of potassa of 33½ per cent in a flask, shake well, and heat on a water bath, frequently shaking. Now add a solution of 50 parts of potassium carbonate in 100 parts of water, and heat until the resulting soap dissolves to a clear liquid in hot water. Dissolve the soap, with the aid of heat, in 1,570 parts of glycerin, set it aside a few days in a cool place, and filter. The filtrate may be perfumed if it is so desired.

No. 2,494.—**Aseptin and Aseptol** (Newark).

This name has been given to an antiseptic liquid (Wiborgh's) composed of 1 part of alum, 2 parts of boric acid, and 18 parts of water.

It must not be confounded with aseptol, which is a 10-per-cent aqueous solution of orthophenylsulphurous acid, and is also used as an antiseptic.

No. 2,495.—**Impure Salicylic Acid** (Dr. C. W. M.).

Attention has been repeatedly drawn to the fact that the artificial synthetic acid, as it is put on the market, often contains more or less of an impurity, which renders it irritating to the stomach and sometimes produces alarming symptoms. The presence of this body was first pointed out by Williams. Squibb gets rid of all or most of it by carefully subliming the commercial acid. The impurity is probably due to the presence of cresyl-salicylic acid (so called by Williams), that is, one or more of the cresotic or homosalicylic acids which are formed from cresol contaminating the phenol from which the salicylic acid is made.

A case was recently tried at Glasgow in which the defendant was charged with having sold salicylic acid containing 2½ per cent of cresotic acid. One of the witnesses, Professor Charteris, testified that since the impurities in the artificial acid had been discovered (he mentioned a Mr. Henderson as the discoverer) he had used only the natural acid in his practice. He once administered one grain of the contaminating cresotic acid to a rabbit weighing two and one-half pounds, and found that to be a fatal dose. He believes that all symptoms of delirium and restlessness which artificial salicylic acid often produces in patients are due to the presence of the above-named impurity. Another witness pointed out that, while the melting point of pure salicylic acid is 156.8°, the British Pharmacopœia gave it as 155°. (This is, however, sufficiently exact, though it would be better to say "between 155° and 156°.")

No. 2,496.—**Artificial Mineral Waters** (F. G.).

When the genuine water cannot be had, and even the artificial carbonated water is out of reach, a close approximation to the original may be reached by preparing a saline mixture as closely approaching the constituents of the mineral water, and dissolving a given quantity of this in water. In nearly all cases it will be found preferable to use carbonic water for solution, though the original mineral water may not contain any gas at all.

As our correspondent asks for formulas for preparing certain waters, we quote the following after Dieterich's "Manuale":

1. *Ems, Kraenchen.*

Sodium Chloride	140 grains.
" Bicarbonate	340 "
Potassium Sulphate	6 "
Calcium Sulphate, precip.	45 "
Magnesium Sulphate, dried	32 "

Mix intimately. This quantity is sufficient to make 10 quarts of artificial "Kraenchen" water. Of course, in administering or taking the salt it is not necessary to observe the exact rate of dilution corresponding to the 10 quarts. A suitable amount of the salt (the quantity being stated below in each case; in the present case it is about 15 grains) is put into an 8-oz. tumbler, some carbonic water added, and, after the salt has been dissolved by stirring, the tumbler is filled up with carbonic water, and the contents drank.

These instructions apply also to the following:

2. *Friedrichshall (Bitter-Water).*

Potassium Sulphate	15 grains.
Sodium Sulphate, dried	620 "
" Chloride	1780 "
" Bicarbonate	154 "
" Bromide	20 "
Calcium Sulphate, precip.	256 "
Magnesium Sulphate, dried	2000 "

Mix thoroughly. Will make 10 quarts of artificial bitter-water. For one tumbler, about 120 grains.

3. *Carlsbad.*

Potassium Sulphate	24 grains.
Sodium Chloride	150 "
" Bicarbonate	425 "
" Sulphate, dried	230 "
Calcium Sulphate, precip.	75 "
Magnesium Sulphate, dried	32 "

Mix thoroughly. To make 10 quarts. For one tumbler, about 24 grains.

4. *Pullna (Bitter-Water).*

Sodium Sulphate, dried	1760 grains.
Potassium Sulphate	90 "
Sodium Chloride	380 "
" Bicarbonate	260 "
Magnesium Sulphate, dried	2900 "
Calcium Sulphate, precip.	90 "

Mix thoroughly. To make 10 quarts. For one tumbler, about 140 grains.

5. *Vichy (Grande Grille).*

Potassium Sulphate	30 grains.
Sodium Chloride	34 "
" Bicarbonate	930 "
Magnesium Sulphate, dried	10 "
Calcium Sulphate, precip.	64 "

Mix intimately. To make 10 quarts. For one tumbler, about 28 grains.

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